
Space Weather Forecast

Issued on Sunday, 12 February 2023 at 13:08 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Chance of Strong flares with Moderate flares (R1/R2 Radio Blackouts) expected. Chance of G1/Minor Storms on days 2 and 3.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: High with a Strong flare observed from the modestly sized but complex sunspot region in the southeast disc, peaking at 11/1548 UTC. There are thirteen sunspot groups on the disc, with three Moderate class flares and multiple Common-class flares observed in the past 24 hours. These mainly from the above mentioned region, but also active spots on the disc.

No significant CMEs (coronal mass ejections) currently detected with available imagery during the last 24hr.

Solar Wind / Geomagnetic Activity: Solar winds continued to be slightly elevated. Observed speeds ranged between 460-530 km/s. The magnetic field strength was mainly weak, with the north-south component varying weakly. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles is at Background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: High to Moderate activity forecast with further Moderate flares expected and a chance of Strong flares. The main risk is from the small but compact sunspot in the southeast that produced the strong flare on the 11th.

Solar Wind / Geomagnetic Activity: Glancing Earth-directed components possible from CMEs (coronal mass ejections) associated with eruptions on the 10th and 11th, giving low confidence for the geomagnetic forecast, with a chance of glancing interactions on day 2 and 3 (13th/14th). Aside from these CMEs, current slightly elevated solar winds are expected to only erratically ease, with no significant enhancements expected.

Geomagnetic activity is currently expected to be mainly Quiet to Unsettled. Perhaps rising to Active with a chance of G1/Minor Storms on days 2 and 3 (13th/14th).

Energetic Particles / Solar Radiation: The count rate of energetic particles is expected to remain at background, but there is a slight chance of this increasing towards the S1/Minor radiation storm level in response to any significant flares that occur.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	1	30	30	10
Strong	G3	No	1	10	5	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	Yes	80	70	60	50
Very Active	R3 to R5 X	Yes	30	20	15	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	15	15	15	15
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)